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ADHD: BIOLOGICAL DISEASE OR PSYCHOSOCIAL DISORDER?
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Accounting for the French-American Divergence in Ritalin Consumption

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ABSTRACT

Psychostimulants (such as Ritalin) are drugs that physicians prescribe to children with Attention Deficit Hyperactivity Disorder (ADHD). Following their introduction in the United States, the use of psychostimulants grew rapidly. However, this has not been the case everywhere, for the US represents 80-85% of the world's psychostimulant consumption. Moreover, some countries, such as France, recognize ADHD as a medical condition but rarely treat it with medications. The aim of this article is to shed light on the American case. Towards that end, I compare the diagnostic systems used by American and French clinicians, an analysis that yields two important findings. First, the American diagnostic system has a much more liberal definition of ADHD, which leads to higher diagnoses and greater psychostimulant consumption. Second, where the American diagnostic system favors a biological understanding of ADHD and the use of medications to treat it, the French system emphasizes a psycho-social understanding and emphasizes psycho-social treatments (such as psychotherapy, family counseling, etc.). Beyond accounting for American medicine's predilection for prescribing psychostimulants, this analysis contributes to a sociology of pharmaceuticals by revealing the synergistic relationship between disease classifications, the diagnosis of disease, and the use of pharmaceutical medications.

INTRODUCTION

Psychostimulants (such as Ritalin) are amphetamine-based medications, which are usually prescribed to children diagnosed with Attention Deficit/Hyperactivity Disorder (ADHD). American psychostimulant consumption has grown tremendously over the last few decades, with Ritalin consumption alone growing 14-fold from 1981 to 2003 (Drug Enforcement Agency). Moreover, researchers estimate that 4-5% of all American children are now taking these medications (Cox et al. 2003; Guevara et al. 2002; Robison et al. 2004; Winterstein et al. 2008). However, such avid use of psychostimulants has not occurred everywhere. In France, another country that recognizes the ADHD syndrome, clinicians are reticent about prescribing psychostimulants to children, with only 0.05% of children taking them (Debroise 2004; Frances et al. 2004). This 80 to 120-fold difference in consumption demonstrates that pharmaceutical markets evolve quite differently from country to country, and shedding light on why is the overarching goal of this paper.

Previous research has focused on pharmaceutical manufacturer marketing behavior and has identified many of the tactics they use to drive demand for their products, including advertising to physicians (Conrad 1976), detailing activities¹ (Oldani 2004), direct-to-consumer advertising (Bell, Kravitz and Wilkes 2000), co-opting patient advocacy groups (Klawiter 2001; Moynihan and Cassels 2005), and, more recently, the marketing of new medical conditions (Moynihan and Cassels 2005). This body of research is invaluable for illustrating the myriad ways pharmaceutical companies try to drive demand for pharmaceutical products. At the same time, however, a strict focus on pharmaceutical manufacturers overlooks the way pharmaceutical consumption is also shaped by diagnostic systems, such as American psychiatry's Diagnostic and Statistical Manual (DSM). While very little has been written about the influence of diagnostic systems, they are very important because they mediate the effectiveness of drug company marketing. Specifically, diagnostic systems guide clinicians in identifying who does and does not qualify for disease diagnoses, which, in turn, determines the potential size of pharmaceutical markets.

To shed more light on the role of diagnostic systems I examine their impact on psychostimulant usage. In addition, for increased analytical leverage, I compare the American case to its French counterpart. Beyond differing in psychostimulant usage, these countries rely on very different diagnostic systems: American physicians rely on the DSM (produced by the

American Psychiatry Association), while French clinicians rely on the International Classification of Diseases (produced by the World Health Organization) and the French Classification of Child and Adolescent Mental Disorders (produced by French child psychiatry). This essay will highlight the many differences between the diagnostic systems, while also drawing out the implications of those differences for psychostimulant consumption.

In the following section I review the state-of-knowledge about disease classifications and pharmaceutical usage, while also providing a conceptualization of each. Then I compare the American diagnostic system to its French counterpart, and show that the American system defines ADHD much more broadly than its French counterpart. In turn, the broader ADHD definition helps to explain America's higher ADHD diagnosis rate and its greater psychostimulant usage. As well, the analysis reveals that while the French conceptualize ADHD as a psycho-social disorder, the American system favors a biological conception, which makes American clinicians more disposed to treat ADHD with a biological treatment, such as psychostimulants. In the conclusion I discuss how these findings illuminate our understanding of medication usage more generally, and conclude by suggesting lines of future research.

I – THEORY: MEDICATION USAGE AND DIAGNOSTIC SYSTEMS

Previous research on medication usage has emphasized the role of pharmaceutical manufacturers, and rightly so as manufacturers have done much to steer our society towards the pharmaceutical option. For instance, they conduct in-person sales calls at physician offices (Oldani 2004), advertise to doctors (Conrad 1976), advertise directly to consumers (Bell, Kravitz and Wilkes 2000; Kravitz et al. 2005), co-opt patient groups (Moynihan and Cassels 2005), use celebrities to advertise their products (Moynihan and Cassels 2005), steer federal research money towards drug treatments (Angell 2000; Bodenheimer 2000), market new medical conditions (Conrad 2005), submit misrepresenting evidence to medical journals (Abramson 2004), and even, at times, co-opt the FDA drug approval process (Horton 2001; Willman 2001). This research has been important for elucidating the myriad ways pharmaceutical manufacturers try to drive the consumption of their products. At the same time, however, a major limitation is that the research doesn't elucidate how marketing efforts are mediated by institutional structures, such as diagnostic systems.

For a more systemic approach, I turn to the work of Cohen et al. (2001), who argue that medications have life cycles that can differ profoundly from one country to the next, and which are shaped by a large number of social systems, such as regulatory, economic, educational, knowledge systems and cultures of care. Their approach is useful for conceptualizing medication usage as a socially embedded phenomenon, which is influenced by many systemic factors as well as the marketing efforts of pharmaceutical companies. I build on the Cohen et al. work by focusing on disease classification systems, exploring how they mediate the use of medications. For a conceptualization of these classification systems, I turn to the work of social constructionists and Allan Horwitz.

Conceptualizing Psychiatric Disease

Historically, sociologists have taken a constructionist approach vis-à-vis mental illness categories, viewing such categories as the product of cultural and social processes, which problematize some symptoms and behavior at particular points in time and place, but not at others. Importantly, constructionists believe that “mental illnesses do not arise in nature but are constituted by social systems of meaning”(Horwitz 2002). In this approach, the mentally ill are not defined by anything they do, but rather by the cultural rules that define what is normal and abnormal behavior. The constructionist approach has much to offer, as it has helped sociologists understand the degree to which psychiatric diagnoses are cultural constructions. At the same time, however, Allan Horwitz (2002) argues that a strict constructionist approach is limited, for it fails to consider the “biological reality” of some disorders, which, he argues, is particularly salient for the more severe disorders, such as schizophrenia, bipolar disorder and other psychoses.

To rectify this shortcoming, Horwitz proposes a more nuanced conceptualization of mental disorders, one that considers the biological reality as well as the cultural overlay. First, he posits that “mental disorders arise when psychological systems of motivation, memory, cognition, arousal, attachment, and the like are not able to adequately carry out the functions they are designed to perform.” Next, he stresses that the standards of psychological functioning vary from society to society, which leads to differences in what is considered “normal” and “abnormal,” as well as differences in the way the societies define their mental disorders.

One advantage of Horwitz's approach is that it enables researchers to analyze the cultural construction of diagnostic concepts without discarding the very real psychological dysfunctions that diagnostic concepts are trying to capture. In turn, this enables researchers to analyze the social forces that shape the diagnostic categories, while remaining sensitive to the patient's lived experience. Another advantage, and one more pertinent to this case, is that Horwitz's model helps us understand how different countries can produce diagnostic concepts (in this case ADHD) that target the same symptoms, yet differ profoundly in their definition of those concepts.

In analyzing the United States, Horwitz (2007) argues that American psychiatry overpathologizes daily life, as its diagnostic system attributes all symptoms to biological dysfunctions, which fails to recognize that some symptoms are brought on by social circumstances. While Horwitz's argument is persuasive, one limitation is that it does not identify how the American case compares to other countries. It could be that the trend towards overpathologization is a worldwide trend. Then again, it could be a trend restricted to the United States. My work helps to fill this void by comparing the American ADHD definition to its French counterpart, and demonstrating that A) American psychiatry defines ADHD much more broadly than its French counterpart and B) American psychiatry favors a biological understanding of ADHD while French child psychiatrists adhere to a psycho-social understanding.

The Relationship Between Disease Definitions and Medication Usage

Differences in mental illness classifications matter, for how a disease is defined guides clinicians on what to consider as illness, which affects the number of people diagnosed with the disease. Consequently, even the smallest change to disease definitions can have enormous diagnostic implications, as emphasized by two researchers:

“by slightly altering the wording of a criterion, the duration for which a symptom must be experienced in order to satisfy a criterion, or the number of criteria used to establish a diagnosis, the prevalence rates in the United States will rise and fall as erratically as the stock market.” (Kutchins and Kirk 1997, p. 244).

Beyond diagnostic implications, disease definitions are also consequential to medication usage, for the greater the disease prevalence, the greater the potential market for a given pharmaceutical treatment.

An interesting example is Alzheimer's Disease, which went from being an obscure disorder prior to 1980, to being among the top five causes of death in the United States. Fox (1989) attributes the change to a shift in the biomedical conceptualization of Alzheimer's. Specifically, the age criterion was removed from the disease definition, which helped transform what was previously considered senility "into a specific disease with specific pathological characteristics and symptoms." In turn, this shift in conceptualization allowed a greater number of symptomatic people to be diagnosed with the disorder, which greatly expanded the treatments provided for that disease (Fox 1989).

Another interesting case is Attention Deficit Hyperactivity Disorder (ADHD), whose American definition expanded significantly with the release of DSM-III-R in 1987, and with the 1994 release of DSM-IV. (Vallée 2009). In particular, the 1987 and 1994 editions increased the number of problematic behaviors that could count as an ADHD symptom. Vallée (2009) argues that this expansion greatly increased the number of children diagnosed with ADHD, and opened the door for America's explosive growth in Ritalin use, which also occurred during the 1980s and 1990s. Beyond expanding the ADHD definition, American psychiatry also changed ADHD's etiological framework from one that focused on social and psychological causal factors, to one that attributed the symptoms to brain chemistry imbalances (Vallée 2009). Relatedly, Vallée demonstrates how these changes predisposed American clinicians to treat children with Ritalin and other psychostimulants, as opposed to addressing the psychological and social sources of the symptoms. A limitation with Vallée's analysis, however, is that it only looks at the United States, and thus fails to address the international scope of these trends. This paper addresses this void by comparing the American ADHD definition to its French counterpart, and analyzing the implications of the differences for psychostimulant consumption.

II - COMPARING AMERICAN AND FRENCH DIAGNOSTIC SYSTEMS

When addressing mental illness American physicians, psychiatrists and other clinicians rely on the Diagnostic and Statistical Manual (DSM), which is American psychiatry's official classification manual for mental disorders. This reference manual, first developed in 1952, has undergone four major revisions – DSM-II in 1968, DSM-III in 1980, DSM-III-R in 1987, and DSM-IV in 1994. The first two versions were developed by psycho-analysts and espoused a psycho-social model of mental illness, which emphasized the psychological and social causes of

mental illnesses. Conversely, DSM-III's development was led by biological psychiatrists (Healy 2002; Kutchins and Kirk 1997), who purged all references to the social and psychological causes of mental illness, and geared the DSM towards the classification of overt behavioral symptoms (Horwitz 2007). This approach de-emphasized concerns with the causes of mental illness, and led clinicians to focus instead on classifying symptoms, a profound shift that implicitly promoted a biological understanding of mental illness. The developers used the same model for DSM-III-R and DSM-IV, and thus further institutionalized the bio-medical revolution in American psychiatry.

While DSM-III, DSM-III-R and DSM-IV ushered a biological revolution in American psychiatry, this was not the case in France, which deliberately eschewed the DSM systems² in favor of the International Classification of Disease (ICD-10) and the French Classification of Children and Adolescent Mental Disorders (CFTMEA). The CFTMEA and ICD-10 differ in important ways from the DSM system. Moreover, teasing out those differences will reveal that A) American and French medicine attribute mental illness to very different causes, B) American psychiatry defines ADHD much more broadly, and C) those differences help to account for America's much greater consumption of psychostimulants.

Comparing the DSM to CFTMEA

The CFTMEA is a classification system that focuses strictly on psychiatric conditions and is currently the system of reference for French child psychiatrists (Misès et al., 2002). The CFTMEA was developed in 1983 by French child psychiatrists, as a direct response to the growing hegemony of the DSM system, which they perceived as overly reductionistic and inappropriate for the French context (Interview 2006). Their overarching concern was that DSM-III diverged too significantly from the diagnostic process used by most French psychiatrists (Misès et al. 2002), and that this “could drastically change clinical practices by focusing all of the clinical and therapeutic attention on isolated symptoms rather than taking into account structural psycho-pathological configurations” (Misès et al. 2002). Consequently, they developed a classification system with definitions and criteria that better fit their clinical psychopathological orientation, which seeks to understand the psychological origin of the disorder, and provides potential outcomes and likely prognoses. While the CFTMEA relies on a psychopathological approach,³ it is used by child psychiatrists from various theoretical

orientations and was validated through a broad study that included professionals from most French public child psychiatric facilities (Misès et al. 2002).

The CFTMEA is similar to the DSM in one respect: both diagnostic systems are dedicated to psychiatric disorders (as compared to the ICD, which also addresses non-psychiatric disease). Despite this similarity, however, the systems differ profoundly in theoretical orientation, for while DSM-IV supporters like to portray their system as being atheoretical (despite implicitly promulgating a biological causal theory) (Kirk and Kutchins 1992), the CFTMEA relies openly on psychodynamic theory. This theoretical difference, in turn, has a number of implications.

First, the theoretical differences lead adherents of each system to interpret symptoms quite differently. In the case of DSM, clinicians users are implicitly encouraged to view symptoms as the manifestation of an underlying biological disorder, regardless of social context (Horwitz 2007). By contrast, social context is much more important in the CFTMEA, which encourages clinicians to view symptoms as the manifestation of an underlying psychological process, which they are obligated to help unravel. For instance, while DSM users are likely to interpret depression as being caused by a brain chemistry imbalance, CFTMEA users are more likely to see depression as having social and/or psychological causes, which they are obliged to help the patient identify and understand.

Second, the theoretical differences lead to significant differences in diagnostic approach. Specifically, the DSM's biological assumption encourages a reductionistic diagnostic approach, which reduces the focus to classifying the patient's overt symptoms. By contrast, the CFTMEA encourages a holistic psychopathological approach, which accounts for the origins of the symptoms, how symptoms relate to one another, and the structural organization of the disorder within which they are included (Misès et al. 2002). Importantly, instead of encouraging clinicians to categorize children into one or another diagnostic category, the CFTMEA's developmental approach encourages clinicians to view children holistically, accounting for how their symptoms are influenced by their psychological history and social environments. In addition, with the CFTMEA the diagnosis is viewed as a work-in-progress, which means that as treatments proceed, clinicians gain a better understanding of the patient's disorder and often change the diagnosis to better fit their increased understanding (Misès et al. 2002). This is not the

case with DSM, which encourages clinicians to slot the child's symptoms in a diagnostic category and then focus on administering the treatment for the disease in question.

Differences in diagnostic approach also have important treatment implications. Whereas the classificatory approach encourages symptom-suppression through medications, the developmental approach seeks to identify and address the social and psychological factors behind behavioral problems, which is often pursued through psychotherapy. While the developmental approach does not automatically reject using medications, it encourages their use to be a last resort, rather than as a primary strategy. Relatedly, that is how Ritalin is used in France, even among the medication's biggest proponents (Bouvard 1999; Bricard and Boiden 2001; Fournieret, Boutière and Revol 2005).

Comparing the DSM-IV to ICD-10

The ICD is an international diagnostic system published by the World Health Organization (WHO), and is used worldwide to track the morbidity and mortality statistics for all diseases (psychiatric and non-psychiatric) as well as help clinicians diagnose diseases (Kendell 1991). The first ICD edition to classify mental disorders was published in 1938 (i.e. ICD-5) and the system has undergone five revisions since then, culminating in ICD-9 and ICD-10, which were published in 1978 and 1991, respectively (Kendell 1991). While the CFTMEA is the system of reference for French child psychiatrists, the ICD-10 is the system of reference for other French clinicians, including pediatricians and neurologists, both of whom also handle ADHD cases (Sechter 1995).

British psychiatrists have played a key role in the development of ICD, and for ICD-9 they favored a developmental approach, which placed it at odds with DSM-III's classificatory approach. For ICD-10 developers tried to close the gap with DSM-III, by incorporating standardized diagnostic criteria (symptom checklists). Despite that change, however, there remain important differences between DSM-IV and ICD-10, as attested by the low 68% concordance rate⁴ between them (Andrews, Slade and Peters 1999). Moreover, the difference between the systems is even greater when we consider that the 68% concordance rate is the average concordance for all diagnostic groups. Comparing individual diagnostic groups reveals significant fluctuation from one diagnostic group to the next. For instance, Table 1 shows that while the concordance rate is high for Dysthymia and Depression (87% and 83%, respectively), it

is very poor for Post-Traumatic Stress Disorder and Substance use/abuse (35% and 33% respectively).

Disorder	Frequency of ICD-10 (%)	Frequency of DSM-IV (%)	Concordance (%)
Dysthymia	3.4	3.1	87%
Depressive Episode	16.6	15.6	83
Substance dependence	7.6	8.5	77
Generalized Anxiety Disorder	9.9	10.1	77
Social Phobia	12.9	10.5	66
Agoraphobia w/ panic disorder	3.9	4.3	66
Obsessive-compulsive disorder	1.9	2.7	64
Panic Disorder	6.1	4.1	56
Agoraphobia w/o panic disorder	3.1	3.9	45
Post-Traumatic Stress Disorder	6.9	3	35
Substance use or abuse	8.4	8.6	33

Source: Andrews et al. 1999

Regarding ADHD, the ICD-10 definition has a much higher threshold for diagnosis, leading to a far lower diagnosis rate: ~1% for ICD-10 vs. ~ 5% for DSM-IV (Jensen 1999).

The ICD-10's ADHD concept is more restrictive for several reasons. First, the ICD-10 version requires that an ADHD diagnosis can only be given when patients manifest both inattention and overactivity, whereas the DSM-IV only requires one or the other (Lee et al. 2008). Second, the DSM-IV counts a greater number of behaviors as indicators of overactivity/hyperactivity. Table 2 shows that while ICD-10 and DSM-IV count motor restlessness, excessive fidgeting, "off-task activity" and "a difficulty to stay seated," the DSM-IV also counts "excessive talking," "trouble playing quietly," "blurting out answers," "trouble waiting one's turn" and "interrupting/intruding on others." Thus, under the DSM-IV, a much greater range of childhood behaviors can qualify a child for an ADHD diagnosis.

TABLE 2 - List of "overactivity" symptoms for ICD-10 and DSM-IV	
Overactivity symptoms for ICD-10 version	Hyperactivity symptoms for DSM-IV
1. continuous and excessive motor restlessness	1. is often "on the go" or often acts as if "driven by a motor"
2. markedly excessive fidgeting	2. often fidgets with hands or squirms in seat
3. excessive levels of off-task activity	3. often runs about or climbs when & where it is not appropriate
4. unduly out of seat when required to be sitting	4. often gets up from seat when remaining in seat is required
	5. has trouble playing quietly
	6. often talks excessively
	7. often blurts out answers before questions have been finished
	8. often has trouble waiting one's turn
	9. often interrupts or intrudes on others

Third, the two systems also differ in what qualifies as “inattentiveness” (see Table 3). While both definitions target distractibility and a lack of persistence, the ICD-10 places more importance on the latter factor as four of its five (#2 thru #5) indicators address a lack of persistence, whereas the same is true for only two of nine DSM-IV indicators (#2 and #3). In addition, DSM-IV directs clinicians to consider more behaviors as indicators of inattention, including carelessness (#4), inobedience (#5 and #6), forgetfulness (#7 and #8), and trouble organizing activities (#9). Thus, here too DSM-IV pathologizes a greater range of childhood behavior and increases the number of behaviors that can lead to an ADHD diagnosis.

TABLE 3 - List of "inattention" symptoms for ICD-10 and DSM-IV	
Inattention symptoms for ICD-10 version	Inattention symptoms for DSM-IV version
1. unduly high distractibility during study	1. is often easily distracted
2. undue lack of persistence at tasks set by adults	2. often has trouble keeping attention on tasks or play activities
3. short duration to spontaneous activities	3. often avoids, dislikes, or doesn't want to do things that take a lot of mental effort for a long period of time.
4. often leaving play activities unfinished	4. often doesn't give close attention to details, or makes careless mistakes in schoolwork, work or other activities 5. Often doesn't seem to listen when spoken to directly 6. often does not follow instructions and fails to finish schoolwork 7. is often forgetful in daily activities 8. often loses things needed for tasks and activities 9. often has trouble organizing activities
5. over-frequent changes between activities	

Beyond targeting a smaller range of symptoms, the ICD-10 definition is more restrictive in four other ways. First, the ICD-10 version requires that symptoms have appeared “before the age of 6 years,” where the DSM-IV only requires that some symptoms have appeared “before age 7.” Second, the ICD-10 prohibits the diagnosis of hyperkinetic disorder (the ICD designation for ADHD) when the patient has anxiety disorders, mood disorders, pervasive developmental disorders or schizophrenia, a restriction that is absent from the DSM-IV diagnosis (APA 1994; Lee et al. 2008; Tripp et al. 1999; WHO 1993). Third, the ICD-10 requires that the inattention/overactivity be directly observed by the clinician, whereas the DSM-IV version does not, allowing diagnoses to be based on teacher and/or parent reports (APA 1994; Tripp et al. 1999; WHO 1993). And fourth, the DSM-IV allows clinicians to make an ADHD diagnosis even if the child fails to manifest all required symptoms. This option is not available with the ICD-10 system. These differences demonstrate that even though the DSM and ICD have standardized checklists for their illness definitions, what counts as mental illness can vary significantly from one system to the next.

The importance of definition differences is that they can exert a strong impact on diagnosis rates. In the case of ADHD researchers found ICD-10's greater restrictiveness to be correlated with fewer ADHD diagnoses. For instance, Tripp et al. (1999) applied DSM-IV and ICD-10 ADHD definitions to 68 children who exhibited disruptive behavior, and found that while 21 children received an ADHD diagnosis under both classification systems, 22 other children received the diagnosis under the DSM-IV but not ICD-10, whereas the opposite was true for only 4 children (Tripp et al. 1999). As well, Lahey et al. (2006) found that only 26% of children diagnosed with DSM-IV ADHD also met the criteria for ICD-10 ADHD. Similarly, a larger and more recent study found the discrepancy to be even greater, as only 11% of 417 DSM-IV cases also met the ICD-10 criteria (Lee et al. 2008). Finally, Peter Jensen, a noted ADHD authority, states that while the use of ICD-10 leads to a European prevalence estimate of 1%, the use of the DSM-IV leads to a 4-5% prevalence rate for the United States (Jensen 1999). These results strongly suggest that using the DSM-IV leads to far more ADHD diagnoses, which lends cross-cultural support for Conrad's (1992) claim that the expansiveness of a disease definition will strongly affect its rate of diagnosis. In addition, the higher ADHD diagnoses associated with the DSM-IV help to account for the United State's greater psychostimulant consumption. In turn, this supports Vallée's (2009) claim that America's growth in psychostimulant consumption is closely tied to the expansion of its ADHD definition.

Regarding our understanding of mental illness, the evidence demonstrates that definitions of illness can vary tremendously from one society to the next. As we saw, the DSM-IV ADHD definition differed significantly from its ICD-10 counterpart, even though the developers of each system employed standardized symptom checklists. Such differences undermine the notion that diagnostic systems are derived solely from objective, empirical science, and suggests that diagnostic systems should be viewed, on the whole, as cultural artifacts.

This point is further reinforced by the DSM and CFTMEA comparison as both systems were developed by psychiatrists, yet both differed profoundly in the way they conceptualized mental illness. Where the American system offers a bio-medical understanding that focuses on biological causes, the French approach is developmental in character and emphasizes social and psychological causes. In addition, the two models reflect divergent ideas about what a person requires to function optimally, for where DSM-IV implicitly encourages clinicians to suppress symptoms with medication, CFTMEA emphasizes the importance of identifying and addressing

the psychological and social causes of symptoms. These points underscore the extent to which diagnostic systems can be inflected by cultural values, which lends support for Payer's (1996) contention that not only do medical practices differ between countries, but that those differences are fueled by differences in cultural values, and cultural presuppositions. All of this should warn us against reifying the DSM or, for that matter, any other diagnostic system as a purely empirical instrument. While the construction of these systems is undeniably influenced by scientific research, they are just as undeniably shaped by cultural values. Moreover, how they are constructed has important implications for how patients will be treated.

SUMMARY AND DISCUSSION

This paper demonstrated that American psychiatry defines ADHD much more broadly than is the case in France, and that the broader definition predisposes American clinicians to diagnose a larger percentage of children with ADHD, which creates a larger potential market for psychostimulants. The paper also showed that American psychiatry conceptualizes ADHD as a biological disorder, whereas French child psychiatrists conceptualize it as a psycho-social disorder. This has important implications for treatment as the American approach encourages biological treatments (such as psychostimulants), whereas the French approach encourages psycho-social treatments (such as psychotherapy, parental education, and teacher education). Overall, these findings illuminate the strong synergistic relationship that can exist between diagnostic definitions, the frequency with which a disease is diagnosed and the use of medications to treat it.

These findings build on existing literature by demonstrating that disease definitions can significantly impact medication usage. Also, it suggests that while pharmaceutical companies exert significant efforts to drive medication usage, the effectiveness of their efforts is mediated by the expansiveness of the disease definition and the etiological framework implicitly embedded in that definition. To shed deeper light on the issue, future research should analyze the relationship between diagnostic definitions and pharmaceutical company behavior. It might be that a restrictive disease definition in one country leads companies to focus their marketing efforts in other countries, who might be using a broader disease definition. Or, a restrictive diagnostic definition might compel pharmaceutical companies to play a more active role in shaping the definition, by co-opting those who are responsible for defining diseases. In the case

of France, preliminary research suggests that the restrictive disease definition led Novartis to completely remove Ritalin from the French market from 1985-1995 (Debroise 2004).

While I have shown the impact diagnostic definitions have on psychostimulant consumption, there are several further avenues to explore. First is the extent to which these findings extend to the consumption of other psychiatric medications. In addition to psychostimulants American children have increased their consumption of many other psychiatric medications (including anti-depressants and anti-psychotics⁵) over the last two decades, and it would seem that this trend was facilitated by American psychiatry's conversion to a biological model. Further research should compare DSM definitions for depression, bipolar disorder and other childhood mental illnesses to their counterparts in the ICD and CFTMEA, and analyze the relationship between disease definitions and medication usage.

Second, researchers should examine the implications of these findings for the pharmaceutical treatment of non-psychiatric diseases. The onset of most (if not all) non-psychiatric diseases is influenced by a host of factors (i.e. nutrition, exercise, exposure to pathogens, immune system strength, genetics, industrial chemicals, etc.), and it seems that the causal factor(s) to which each disease is attributed will have a significant effect over treatment choice. For instance, if heartburn is understood strictly as a genetic phenomenon, the patient is likely to address it through pharmaceutical treatments. However, if he/she understands that diet and nutrition also contribute to the problem, they are less likely to rely solely, or at all, on pharmaceutical treatments. Thus, future research should carefully analyze the etiological frameworks that are implicitly embedded in diagnostic definitions and elucidate how those frameworks influence disease treatment.

In addition, researchers should consider the conspicuous absence of competing causal models, particularly those focusing on dietary factors and industrial chemicals. For instance, since the early 1970s a growing body of literature has demonstrated that ADHD symptoms can be brought on by childrens' exposure to lead (Needleman et al. 1990; Tuthill 1996), manganese (Crinella, Cordova and Ericson 1998) and other industrial chemicals (Schettler et al. 2000). Moreover, prominent toxicologists insist that any children suspected of having ADHD should be first assessed for chemical exposure (personal communication 2007). Despite the mounting evidence, however, the role of industrial chemicals is not discussed in the ADHD treatment guidelines produced by American pediatrics and American psychiatry. Moreover, it is rarely

mentioned in the mainstream medical literature, and in discussions about how to address ADHD. Future research should investigate why, elucidating the extent to which competing etiological models have been downplayed, the process by which this has happened, the role that industry (chemical manufacturers) has played in the process, and how downplaying those models has benefited the market growth of specific pharmaceutical products.

Fourth, while this article has operated with the underlying assumption that the definitions influence clinicians, follow-up research should investigate the degree to which they actually do. Also, such research should investigate how clinicians' use of diagnostic definitions is mediated by other institutional structures, such as healthcare systems and culture. With regard to healthcare systems, it could be that managed-care imposes time-constraints on clinical visits, which lead clinicians to rely more on standardized disease definitions than would be the case for physicians in private practice.

Another line of research could analyze the process by which disease classifications are developed, and altered over time. A contribution towards this project is Kirk and Kutchin's *The Selling of DSM: The Rhetoric of Science in Psychiatry* (1992), which masterfully illustrates the political and rhetorical tactics that developers used in constructing and selling the controversial DSM-III. Researchers can build on that work by investigating the development of specific diagnostic definitions (such as depression or conduct disorder), and focusing the analysis on the definition developers. Specifically, they could analyze the process by which the developers were selected, the social networks from which developers emerged, and the extent to which those networks shaped the disease definitions. For instance, researchers could map out each developer's institutional affiliations (including ties with universities, governmental agencies, and/or non-governmental organizations) and analyze the extent to which those relationships shaped the disease definitions. Similarly, researchers could analyze the developers' relationships with pharmaceutical companies. The pharmaceutical link seems particularly relevant when we consider A) the strong incentive pharmaceutical manufacturers have over the final version of a disease definition, and B) the recent revelation that 56% of DSM-IV developers had financial relationships with one or more pharmaceutical companies (Cosgrove et al. 2006).

To conclude, I expect future research will show that diagnostic definitions systematically bias American clinicians to treat most diseases with pharmaceutical products, and that the construction of these definitions is highly mediated by economic, political, and cultural forces.

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NOTES

¹ “Detailing” is a marketing tactic whereby pharmaceutical representatives visit physician offices in order to “educate” physicians about the “details” of the drugs. Invariably, the focus is on informing physicians of the various conditions for which the drugs can be used, which include FDA-sanctioned uses as well as unsanctioned, “off label” uses.

² From here to the end of the paper, “DSM systems” refers to the DSM-III, DSM-III-R, and DSM-IV, all of which advocate a biological and categorizing diagnostic approach.

³ The psychopathological approach attributes mental disorders to psychological causes, as opposed to biological or social ones.

⁴ The concordance rate refers to the percentage of cases with a positive diagnosis on either classification system that has a positive diagnosis on both classification systems (Andrews et al. 1999).

⁵ For instance, from 1987 to 1996 the number of American children consuming anti-depressants grew from 0.30% to 1.06% of all 6-14 year olds. For 15-18 year olds the increase was from 0.5% to 2.12% (Olfson et al. 2002). As for antipsychotics, the number of children consuming these medications grew from 0.86% in 1996 to 3.96% in 2002 (Cooper et al. 2006).